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(54) Abstract Title

Ventilated containers

(57) A container 1 comprises first and second shells 2,4, preferably integrally hinged together, at least one shell having in a marginal region a curved or otherwise shaped formation 42 for defining a ventilating port 60 in the closed container. Preferably, both shells 2,4 have a plurality of such formations 42. At least one shell 2,4 preferably has ventilating holes in its base and an annular shoulder around the base of the lower shell 2 may be formed with channels for ventilation of the underside of the container. Also, raised lands 52 may facilitate ventilation between containers in a stack.

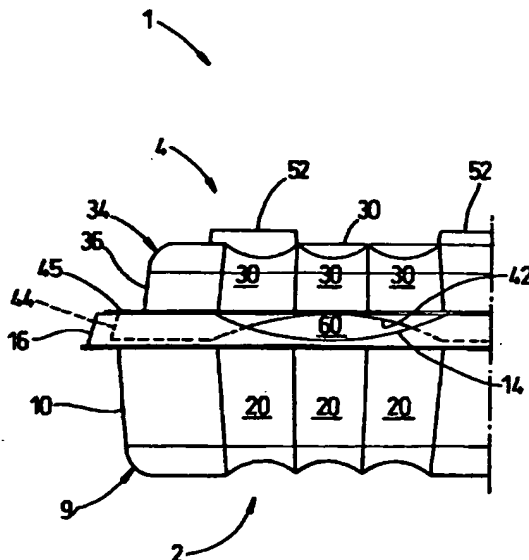


Fig. 3

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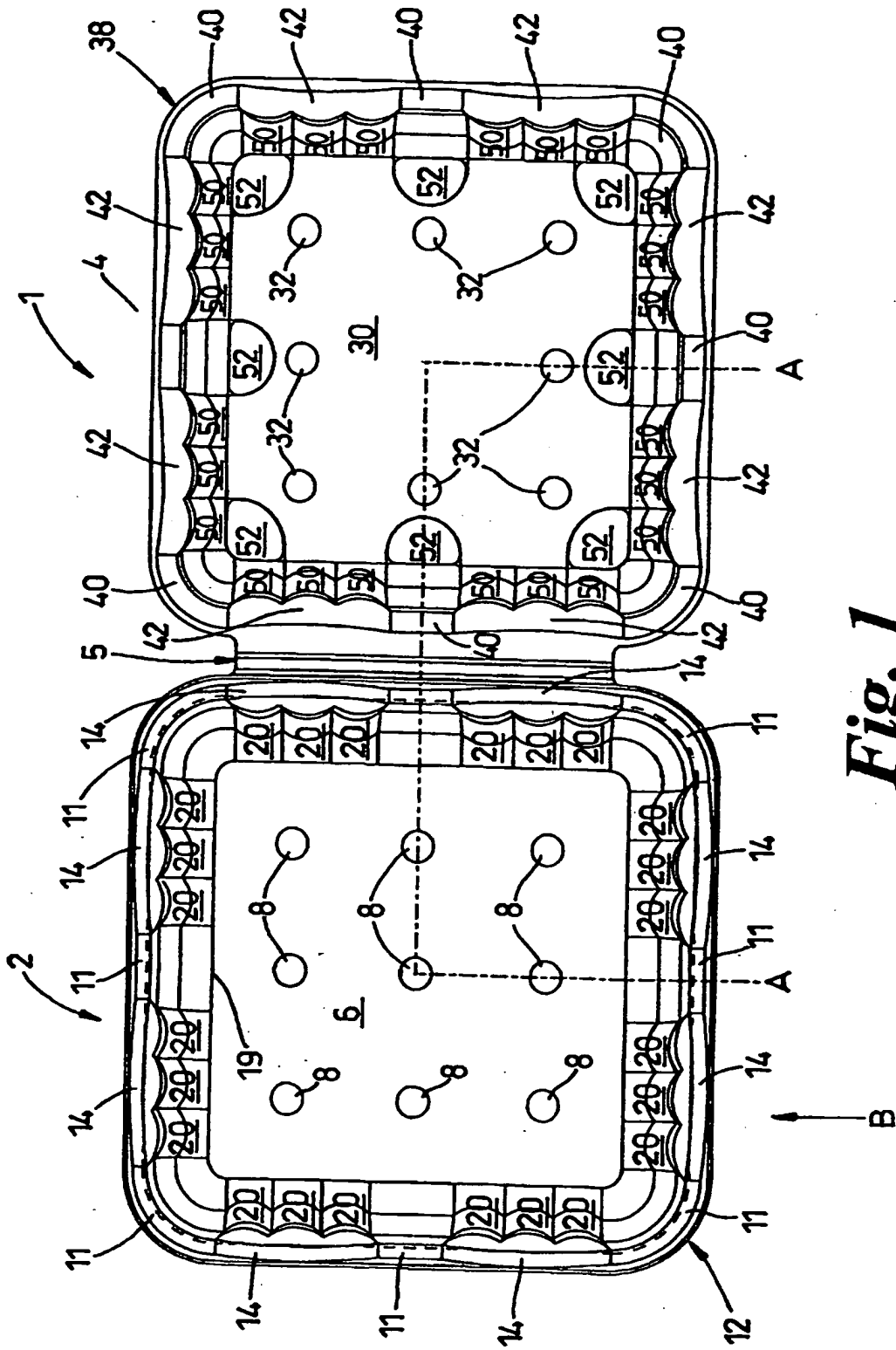


Fig. 1

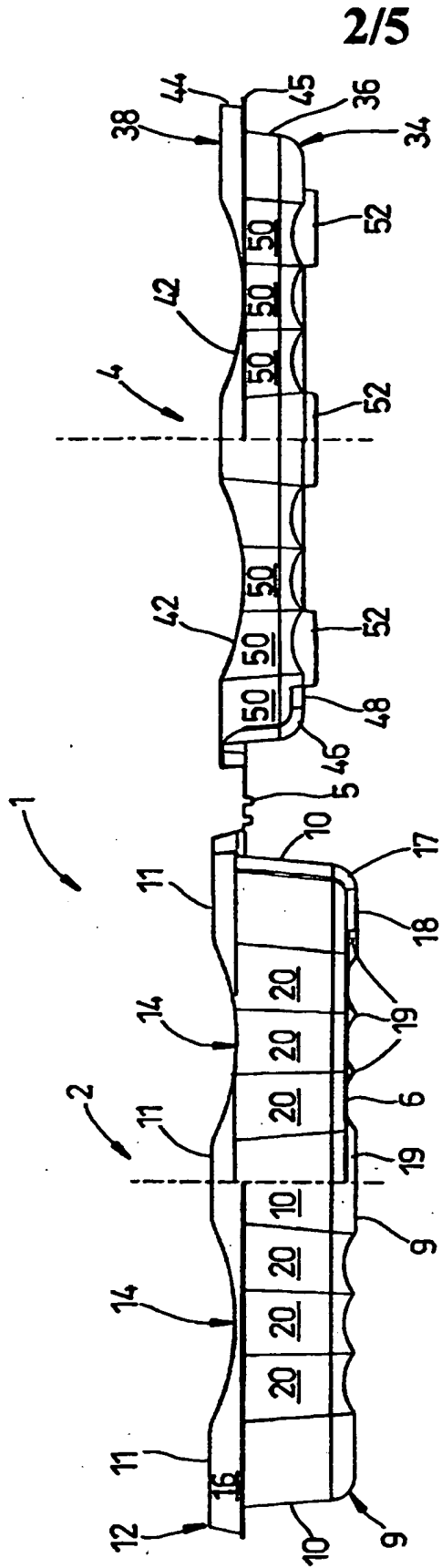


Fig. 2

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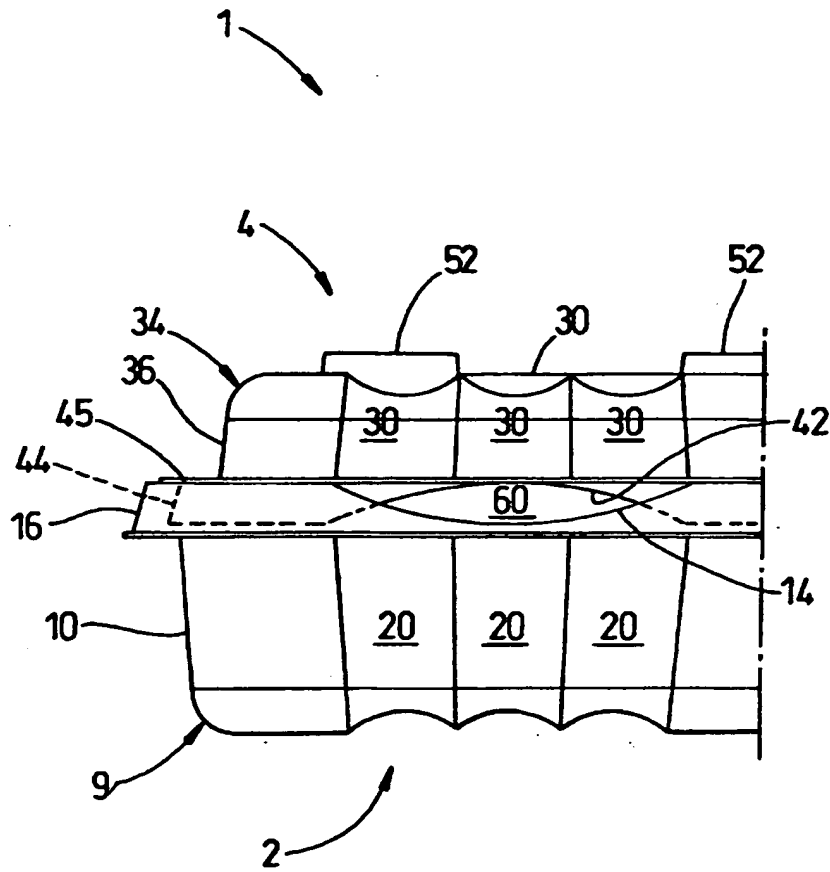


Fig. 3

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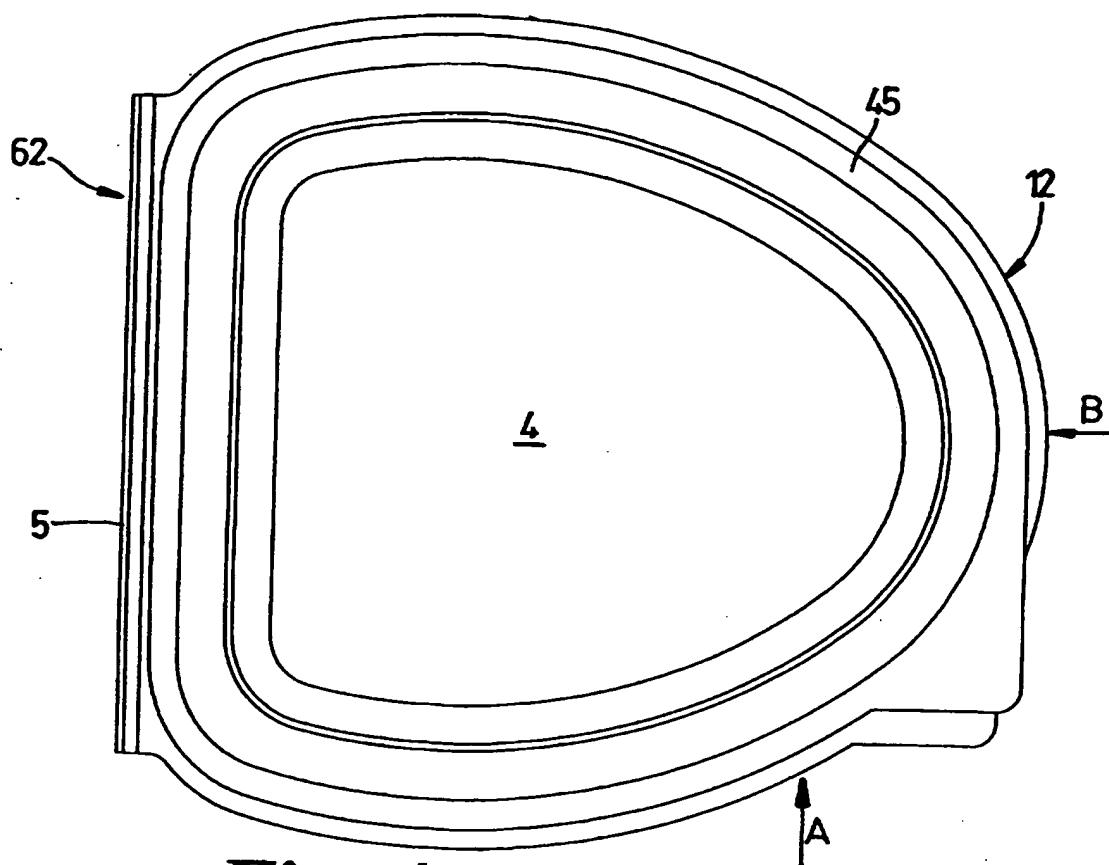


Fig. 4

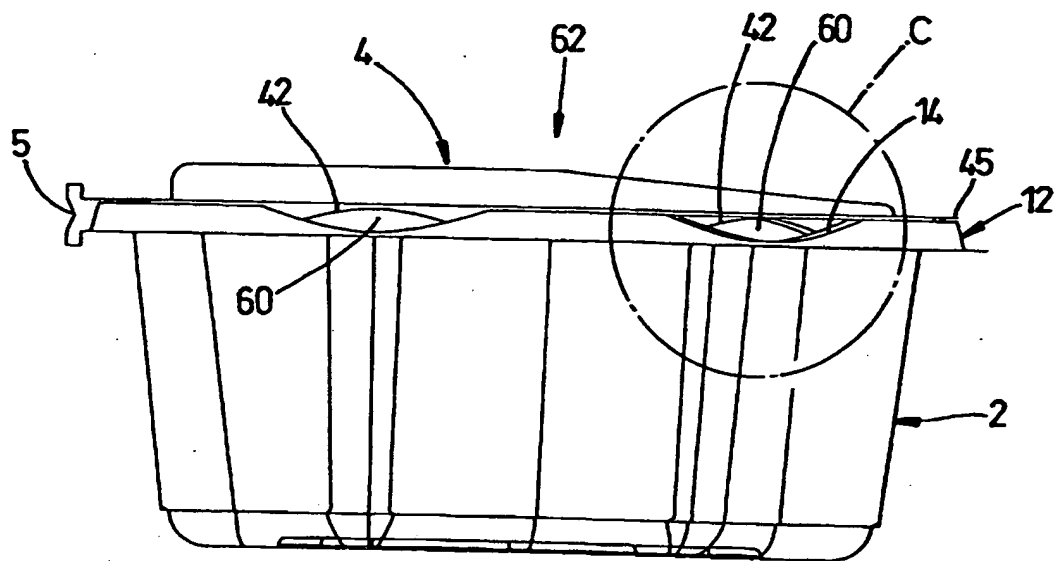


Fig. 5

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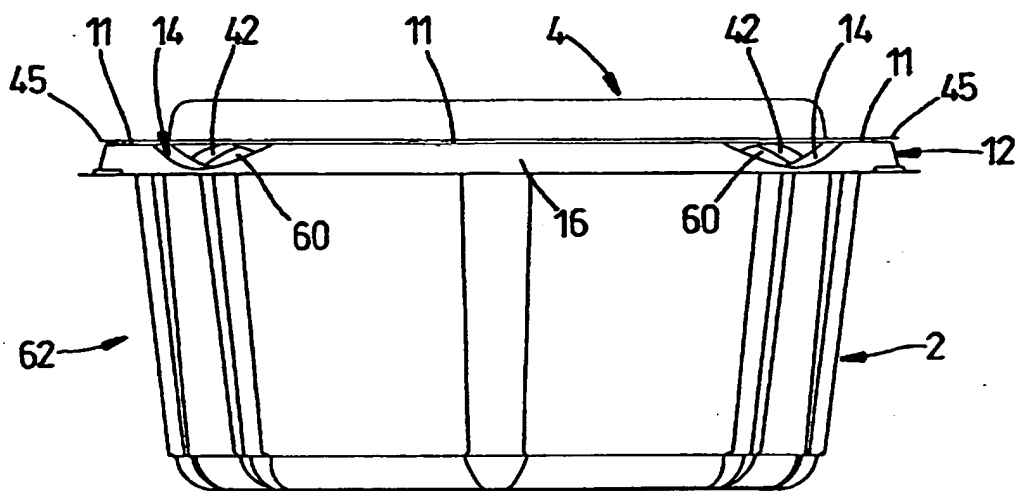


Fig. 6

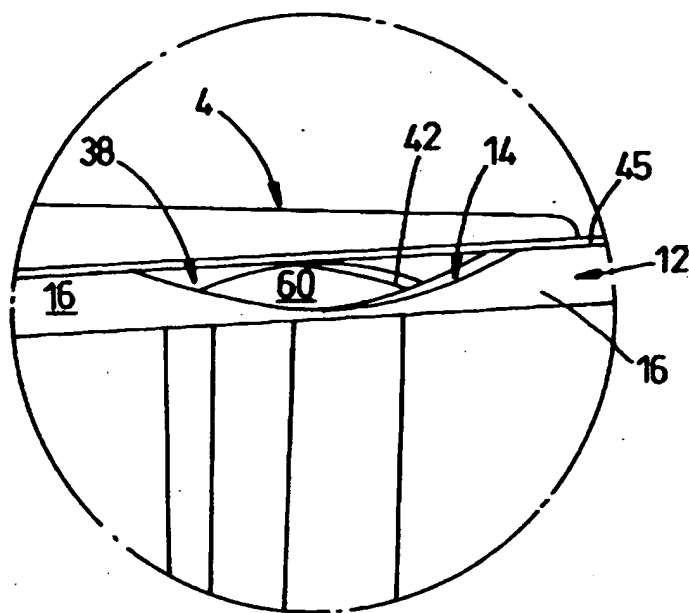


Fig. 7

MOULDED CONTAINER WITH LID

The present invention relates to a container comprising a lid and is concerned particularly, although not exclusively with ventilation means for such containers.

- 5 The invention relates in particular to containers which comprise first and second shells, the margins of which are adapted to engage with one another in the closed condition of the container, one of the shells acting as a lid. The lid often has a snap-engagement with the other shell.

- At present moulded plastic containers are used to transport and display
10 fresh produce such as fresh fruit or salad. It is important that the produce is well ventilated to help stop it from spoiling too quickly. The container shells are formed with circular holes to aid the ventilation of the produce. The holes are formed in the top surface of the lid and the bottom surface of the other shell. Sometimes additional ventilation holes
15 are punched through the side walls of the container shells.

- When such containers are stacked one on top of another some of the holes are obstructed or sealed. In particular air flow tends to be substantially restricted from passing through the holes formed in the top and bottom surfaces of the container. This reduces the effective ventilation of the
20 container. Also, the holes formed in the sides of the container reduce the overall strength of the container. The strength is important as the container protects the produce from being crushed. The strength of the container also dictates how many containers can be stacked one on top of another.

- 25 According to a first aspect of the present invention there is provided a container comprising first and second shells which are adapted to be

secured together with marginal portions of the respective shells co-operating with one another in the closed condition of the container, the first shell comprising a base and a surrounding side wall extending in a direction away therefrom, the distal portion of the side wall forming the mouth of the first shell, the marginal portion of the first shell being formed around the perimeter of the mouth of the first shell, the second shell comprising a base and a surrounding side wall extending away therefrom, the distal portion of the second shell side wall forming the mouth of the second shell, the marginal portion of the second shell being formed around the perimeter of the mouth of the second shell, the marginal portion of at least one of the shells comprising a shaped region that extends in a direction away from the plane of the marginal portion of the other shell, the arrangement being such that when the container is in the closed condition said marginal portion provides fluid communication to the inner space of the container.

Preferably, the base of at least one of the shells comprises ventilation means. It is preferable that the ventilation means is a plurality of holes through the base.

Said shaped region of the marginal portion and ventilation means allows air to flow through the container when the container is in a closed condition.

The shaped region conveniently provides an opening means for the container which can be used to separate one shell from the other.

Preferably the shaped region extends in a direction towards the base of said one shell.

The marginal portion of each shell preferably comprises a shaped region that extends towards the base of the respective shell, the arrangement being such that when the container is in the closed condition said shaped regions provide fluid communication to the inner space of the container.

- 5 It is preferable that the shaped region of the marginal portion of the first shell aligns substantially with the shaped region of the marginal portion of the second shell when the container is in the closed condition.

10 Preferably, the marginal portion of each shell comprises a plurality of such shaped regions each extending towards the base of the respective shells.

It is preferable that the shaped regions of the marginal portion of the first shell align substantially with the corresponding shaped regions of the marginal portion of the second shell when the container is in the closed condition.

- 15 The marginal portions of the shells preferably form respective castellated shaped rims around the respective mouths of the shells.

20 Preferably, the second shell forms the lid of the container. The castellated rim of the second shell is preferably disposed substantially radially inside the castellated rim of the first shell when the container is in the closed condition.

The castellated rim of the lid preferably comprises a radially outer down-turned wall directed towards the base of the lid and overlapping the radially outermost surface of side wall of the lid. Preferably, a peripheral flange extends from the distal edge of the down-turned wall in
25 a direction away from the side wall.

It is preferable that in the closed condition the peripheral flange of the lid abuts the uppermost portions of the castellated rim of the first shell.

According to a second aspect of the present invention there is provided a container comprising first and second shells which are adapted to be
5 secured together with marginal portions of the respective shells co-operating with one another in the closed condition of the container, the first shell comprising a base comprising ventilation holes, an annular shoulder extending around the base and a side wall extending in a direction away from the annular shoulder in a direction away from the
10 base, the distal region of the side wall forming the mouth of the first shell, the second shell comprising a base and a side wall extending away therefrom, the annular shoulder of the first shell being formed with at least one channel, the arrangement being such that when the container in the closed condition is placed on a surface each channel of the container
15 provides fluid communication to the underside of the base of the container.

The annular shoulder preferably comprises a plurality of channels extending through said shoulder.

The annular shoulder preferably comprises an annular land and a radially
20 inner annular wall extending from the annular land towards the mouth of the first shell and the perimeter of the base of the first shell preferably being contiguous with the radially inner annular wall, the arrangement being such that the plane of the base is substantially parallel to the annular land.

25 It is preferable that the channels are of substantially curved shaped in transverse cross-section.

Preferably, the side wall of the first shell is also formed with the channels such that the channels extend continuously from the base, around the shoulder and towards the mouth of the first shell.

It is preferable that the second shell is formed with an annular shoulder
5 extending around the base, and the side wall extends away from said shoulder.

Preferably, the second shell is the lid of the container. It is also preferable that the side wall and annular shoulder of the lid are formed with channels similar to those of the first shell.

10 The walls of the channels can provide strengthening and rigidity to the container.

It is preferable that both of the respective bases comprise ventilation holes.

According to a third aspect of the present invention there is provided a
15 container comprising first and second shells which are adapted to be secured together with marginal portions of the respective shells co-operating with one another in the closed condition of the container, the second shell comprising a base and a side wall extending in a direction away from the base, the base of the second shell comprising raised
20 locating portions, the first shell comprising a base and a side wall extending in a direction away therefrom, the base of the first shell comprising a radially inner planar portion and radially outer raised regions extending radially away from the planar portion, the arrangement being such that when the container is in the closed condition and a first
25 such container is placed on top of a second such container the raised locating portions of the second container interlock with the raised regions

of the second container and the opposing bases of the respective containers are held substantially spaced from each other such that there is provided fluid communication between the opposing faces of the respective bases of the two containers.

- 5 It is preferable that the raised locating portions substantially prevent any movement of the two containers parallel to the planes of the bases of the respective containers.

Preferably, the container is of square shape and the second shell forms the lid of the container. Preferably, there are four raised portions each
10 being located at the respective corners of the lid and four raised regions each being located at the respective corners of the first shell, the arrangement being such that in the closed condition and when a first container is placed on top of a second container the four raised portions of the lid of second shell are disposed radially within the four raised
15 portions of the second shell of the second container.

Preferably, there are four additional raised portions, each additional raised portion being located equidistant between the corners of the lid and about the perimeter of the lid.

Preferably, when the containers are stacked on top of each other only one
20 corner of the square shaped raised portion of the lower container abuts the raised region of the above container.

It will be appreciated that the present invention can include a combination of two or more of the above aspects.

The present invention may be carried into practice in various ways. However, an embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings, of which:

5 **Figure 1 shows a plan view of a container in an open condition and in accordance with the various aspects of the invention;**

Figure 2 shows a cross section on the staggered line A-A of Figure 1;

Figure 3 shows a partial end view in direction B of the container in the closed condition;

10 **Figure 4 shows a plan view of a further embodiment of a container in the closed condition and in accordance with the various aspects of the invention;**

Figure 5 shows a side view in direction A of the container shown in Figure 4;

15 **Figure 6 shows a front view in direction B of the container shown in Figure 4; and**

Figure 7 shows an enlarged view of the detail C shown in Figure 5.

20 **Figures 1 and 2 show a square plastic container 1 comprises a first shell 2 and a second shell 4. The second shell 4 forms the lid of the container 1 and is connected to the first shell by an integral hingeable strip 5.**

In alternative arrangement the container comprises two separate shells.

The container 1 is thermoformed from an extruded sheet of plastics material. The container 1 may, for example, be pressure formed or vacuum formed. Alternatively, the container may be injection moulded.

- 5 The first shell 2 is greater in depth than the second shell 4. The first shell 2 comprises a substantially planar square base 6 formed with nine circular ventilation holes 8 arranged in three transverse rows of three, a curved annular shoulder 9 extending around the base 6 and a side wall 10 extending away from the shoulder 9 at an acute angle to the vertical. The
10 uppermost distal region of the side wall 10 forms the mouth of the shell 2.

- Formed around the perimeter of the mouth of the first shell 2 is a margin 12. The margin 12 forms an inverted channel around the mouth of the first shell 2. The margin comprises an annular land which is
15 substantially parallel to the plane of the base 6. The annular land comprises eight upper land regions 11 separated by eight curved regions 14 which extend a direction towards the base 6. The upper land regions 11 and curved regions 14 form a castellated rim around the shell 2. Extending from the radially outermost perimeter of the annular
20 land is a skirt 16. The skirt 16 extends towards the base 6, and overlaps and is spaced from the radially outermost surface of the side wall 10.

- The shoulder 9 comprises a curved portion 17 and a substantially horizontal portion 18 extending radially inward from the curved portion 17 towards the centre of the base 6 (see figure 2). At the radially
25 innermost perimeter of the portion 18 is an upwardly extending wall 19. The base 6 is extends from the uppermost perimeter of the wall 19.

The side wall 10 and shoulder 9 are formed with twenty four curved channels 20 arranged in contiguous groups of three. The channels 20 curve inwardly towards the inside of the shell 2. Each channel 20 extends downward from the mouth of the shell 2 along the side wall 2, around the shoulder 9 and through the wall 19. The orientation of the channels 20 rotates by approximately 90 degrees from the vertical to the horizontal.

The horizontal parts of the channels 20 provided fluid communication for the base 6 when the shell 2 is placed on a flat surface or on another container.

The second shell 4 comprises a substantially planar square base 30 formed with nine circular ventilation holes 32 arranged in three transverse rows of three, a curved annular shoulder 34 extending around the base 30 and a side wall 36 extending away from the shoulder 34 at an acute angle to the vertical. The uppermost distal region of the side wall 36 forms the mouth of the shell 4. Formed around the perimeter of the mouth of the first shell 4 is a margin 38. The margin 38 forms an inverted channel around the mouth of the shell 4. The margin 38 comprises an annular land which is substantially parallel the plane of the base 30. The annular land comprises eight upper land regions 40 separated by eight curved regions 42 extending a direction towards the base 30. The margin 38 forms a castellated rim around the shell 4. Extending from the radially outermost perimeter of the annular land is a skirt 44. The skirt 44 extends towards the base 30 and overlaps the side wall 36. The skirt 44 is spaced from the radially outermost surface of the side wall 36. At the distal edge of the skirt 44 there is a flange 45 extending tangentially therefrom.

The shoulder 34 comprises a curved portion 46 and a substantially horizontal portion 48 extending inwardly from the curved portion 46 towards the centre of the shell 4.

5 The side wall 36 and shoulder 34 are formed with twenty four curved channels 50 arranged in contiguous groups of three. The channels 50 curve inwardly towards the inside of the shell 4. Each channel 50 extends downward from the mouth of the shell 4 along the side wall 36, around the shoulder 34 and abuts the base 30. The orientation of the channels 50 rotates by approximately 90 degrees from the vertical to the
10 horizontal.

Formed around the perimeter of the base 30 are eight raised lands 52. Four of the lands 52 are located at the corners of the base 30 and four are equidistant between the corners of the base 30.

15 Referring to figure 3, the container is in the closed condition and the margin 38 of the second shell 4 is received within ,and engages with, the margin 12 of the first shell 2. The two margins 12, 38 form a snap-engagement. In the closed condition the flange 45 of the shell 4 rests upon the eight upper land regions 11.

20 It will be appreciated that the flange 45 does not extend beyond the radially outermost perimeter of the margin 16.

This has the benefit of substantially reducing the chance of the second shell being accidentally levered off the first shell. This can be a particular problem when containers are placed side by side in a transport tray. At present containers having an opening tab or an extended flange
25 with which to open the container are prone to accidental opening during transit.

In the closed condition the eight curved regions 14 of the first shell 2 substantially align with the eight curved regions 42 of the second shell 4 so forming ports 60 which allow air ventilation to the inside of the container 1. The ports 60 also provide means to open the container. A
5 digit or appropriate tool can be easily inserted into the port and the lid of the container being separated from the first shell by a lever action.

When a first container is stacked one on top of a second container, each container being in accordance with the present invention, the horizontal part channels 20 of the uppermost container provide fluid communication
10 to the holes 8 of the uppermost container and also to the holes 32 of the lowermost container. Air can flow through the holes 32 into the container and through the ports 60 and the holes 8. The raised lands 52 of the lowermost container are received radially within the shoulder 9 of the uppermost container. The radially outermost surfaces of the raised
15 lands 52 of the lowermost container abut the wall 19 of the uppermost container. The two containers are prevented substantially from any translational movement parallel the planes of the bases 6,30. The respective bases 6, 30 are held separated by the lands 52.

A stack of containers has increased air ventilation due to the features of
20 the present invention. Air can flow more freely through the body of the containers. This increased air flow helps to keep the produce carried in the containers fresh.

Turning to Figures 4 to 7, this shows an alternative container design in the form of a D-shaped container 62. Many features of this embodiment
25 are substantially the same as those described with reference to Figures 1 to 3 of the accompanying drawings. Similar numerals have been used, therefore, to describe similar components and further description will not be given. However, with this embodiment the container 62 is formed

with four ports 60 when the container 62 is in the closed condition. The ports 60 allow air ventilation to the inside of the container 62.

CLAIMS

1. A container comprising first and second shells which are adapted to be secured together with marginal portions of the respective shells co-operating with one another in the closed condition of the container, the
5 first shell comprising a base and a surrounding side wall extending in a direction away therefrom, the distal portion of the side wall forming the mouth of the first shell, the marginal portion of the first shell being formed around the perimeter of the mouth of the first shell, the second shell comprising a base and a surrounding side wall extending away
10 therefrom, the distal portion of the second shell side wall forming the mouth of the second shell, the marginal portion of the second shell being formed around the perimeter of the mouth of the second shell, the marginal portion of at least one of the shells comprising a shaped region that extends in a direction away from the plane of the marginal portion of
15 the other shell, the arrangement being such that when the container is in the closed condition said marginal portion provides fluid communication to the inner space of the container.
2. A container as claimed in claim 1, wherein the base of at least one of the shells comprises ventilation means.
- 20 3. A container as claimed in claim 2, wherein the ventilation means is a plurality of holes through the base.
4. A container as claimed in any one of claims 1, 2 or 3, wherein the shaped region extends in a direction towards the base of said one shell.
5. A container as claimed in any one of the previous claims, wherein
25 the marginal portion of each shell comprises a shaped region that extends towards the base of the respective shell, the arrangement being such that

when the container is in the closed condition said shaped regions provide fluid communication to the inner space of the container.

6. A container as claimed in any one of the previous claims, wherein the shaped region of the marginal portion of the first shell aligns
5 substantially with the shaped region of the marginal portion of the second shell when the container is in the closed condition.

7. A container as claimed in any one of the previous claims, wherein the marginal portion of each shell comprises a plurality of such shaped regions each extending towards the base of the respective shells.

10 8. A container as claimed in any one of the previous claims, wherein the shaped regions of the marginal portion of the first shell align substantially with the corresponding shaped regions of the marginal portion of the second shell when the container is in the closed condition.

9. A container as claimed in any one of claims 5 to 8, wherein the
15 marginal portions of the shells form respective castellated shaped rims around the respective mouths of the shells.

10. A container as claimed in any one of the previous claims, wherein, the second shell forms the lid of the container.

11. A container as claimed in claim 9 or claim 10, wherein castellated
20 rim of the second shell is disposed substantially radially inside the castellated rim of the first shell when the container is in the closed condition.

12. A container as claimed in claim 10 or claim 11, wherein the castellated rim of the lid comprises a radially outer down-turned wall

directed towards the base of the lid and overlapping the radially outermost surface of side wall of the lid.

13. A container as claimed in claim 12, wherein a peripheral flange extends from the distal edge of the down-turned wall in a direction away
5 from the side wall.

14. A container as claimed in any one of claims 10 to 13, wherein the closed condition the peripheral flange of the lid abuts the uppermost portions of the castellated rim of the first shell.

15. A container comprising first and second shells which are adapted
10 to be secured together with marginal portions of the respective shells co-operating with one another in the closed condition of the container, the first shell comprising a base comprising ventilation holes, an annular shoulder extending around the base and a side wall extending in a direction away from the annular shoulder in a direction away from the
15 base, the distal region of the side wall forming the mouth of the first shell, the second shell comprising a base and a side wall extending away therefrom, the annular shoulder of the first shell being formed with at least one channel, the arrangement being such that when the container in the closed condition is placed on a surface each channel of the container
20 provides fluid communication to the underside of the base of the container.

16. A container as claimed in claim 15, wherein the annular shoulder comprises a plurality of channels extending through said shoulder.

17. A container as claimed in claim 16, wherein the annular shoulder
25 comprises an annular land and a radially inner annular wall extending from the annular land towards the mouth of the first shell and the

perimeter of the base of the first shell being contiguous with the radially inner annular wall, the arrangement being such that the plane of the base is substantially parallel to the annular land.

18. A container as claimed in claim 16 or claim 17, wherein the
5 channels are of substantially curved shaped in transverse cross-section.

19. A container as claimed in any one of claims 15 to 18, wherein the side wall of the first shell is formed with the channels such that the channels extend continuously from the base, around the shoulder and towards the mouth of the first shell.

- 10 20. A container as claimed in any one of claims 15 to 19, wherein the second shell is formed with an annular shoulder extending around the base, and the side wall extends away from said shoulder.

21. A container as claimed in any one of claims 15 to 20, wherein the second shell is the lid of the container.

- 15 22. A container as claimed in claim 21, wherein the side wall and annular shoulder of the lid are formed with channels similar to those of the first shell.

23. A container as claimed in any one of claims 15 to 22, wherein both of the respective bases comprise ventilation holes.

- 20 24. A container comprising first and second shells which are adapted to be secured together with marginal portions of the respective shells co-operating with one another in the closed condition of the container, the second shell comprising a base and a side wall extending in a direction away from the base, the base of the second shell comprising raised

locating portions, the first shell comprising a base and a side wall extending in a direction away therefrom, the base of the first shell comprising a radially inner planar portion and radially outer raised regions extending radially away from the planar portion, the arrangement
5 being such that when the container is in the closed condition and a first such container is placed on top of a second such container the raised locating portions of the second container interlock with the raised regions of the second container and the opposing bases of the respective containers are held substantially spaced from each other such that there is
10 provided fluid communication between the opposing faces of the respective bases of the two containers.

25. A container as claimed in claim 24, wherein the raised locating portions substantially prevent any movement of the two containers parallel to the planes of the bases of the respective containers.

15 26. A container as claimed in claim 24 or claim 25, wherein the container is of square shape and the second shell forms the lid of the container.

27. A container as claimed in claim 26, wherein there are four raised portions each being located at the respective corners of the lid and four
20 raised regions each being located at the respective corners of the first shell, the arrangement being such that in the closed condition and when a first container is placed on top of a second container the four raised portions of the lid of second shell are disposed radially within the four raised portions of the second shell of the second container.

25 28. A container as claimed in claim 27, wherein there are four additional raised portions, each additional raised portion being located

equidistant between the corners of the lid and about the perimeter of the lid.

29. A container as claimed in claim 27 or claim 28, wherein when the containers are stacked on top of each other only one corner of the square
5 shaped raised portion of the lower container abuts the raised region of the above container.

30. A container substantially as herein described with reference to the accompanying drawings.



Application No: GB 9920721.9
Claims searched: 1 to 14 & 30

Examiner: Mike Henderson
Date of search: 11 November 1999

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK CI (Ed.Q): B8P (PD PV PE2B PK5)

Int CI (Ed.6): B65D 1/22 1/40 1/44 51/16 81/26 85/72

Other: ONLINE:WPI,EPODOC,JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2215311A (EMIL LUX GmbH & Co KG) (Figs 1 to 3 particularly relevant)	1,4 to 11 & 14
X	GB 2200340A (DOLPHIN PACKAGING MATERIALS LTD) (Whole disclosure relevant)	1,4,10 & 14
X	GB 2195318A (I S A P SpA) (Whole disclosure relevant)	1 to 10 & 14
X	US 4883195 (RESTAURANT TECHNOLOGY) (Whole disclosure relevant)	1,2,4 & 10
X	US 4600117 (CIDELCEM) (Whole disclosure relevant)	1,4 to 11 & 14

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